CORRECTED LISTING OF CLAIMS

Please cancel claims 1-4 and 44 without prejudice or disclaimer. The listing of claims below will replace all prior versions and previous listings of claims in this application:

1.-4. (cancelled)

5. (currently amended) A monoclonal antibody or fragment thereof ~~according to claim 1~~ capable of binding specifically to the extracellular I-domain of the integrin alpha10 chain, wherein the antibody is produced by the hybridoma cell line deposited at the Deutsche Sammlung von Microorganismen und Zellkulturen GmbH under the accession number DSM ACC2583.

6. (previously presented) A hybridoma cell line deposited at the Deutsche Sammlung von Microorganismen und Zellkulturen GmbH under the accession number DSM ACC2583.

7. (withdrawn) A method for isolating a population of mammalian mesenchymal stem cells, the method comprising the steps of:

a) providing a cell suspension comprising mammalian mesenchymal stem cells,

b) contacting the cell suspension in a) with a monoclonal antibody or a fragment according to claim 1, under conditions wherein said monoclonal antibody or a fragment thereof forms an antibody-antigen complex with the extracellular domain of integrin alph10 beta1,

c) separating cells binding to the monoclonal antibody or a fragment thereof in b), and optionally

d) recovering cells binding to the monoclonal antibody or a fragment thereof in c) from said antibody or a fragment thereof,

thereby producing a population of mammalian mesenchymal stem cells, optionally free from aid antibody or a fragment thereof.

8. (withdrawn) A method for isolating a population of mammalian chondrocytes, the method comprising the steps of:

a) providing a cell suspension comprising chondrocytes,

b) contacting the cell suspension in a) with a monoclonal antibody or a fragment thereof according to claim 1, under conditions wherein said monoclonal antibody or a fragment thereof forms an antibody-antigen complex with the extracellular I-domain of integrin alpha10beta1,

c) separating cells binding to the monoclonal antibody or a fragment thereof in b), and optionally

d) recovering cells binding to the monoclonal antibody or a fragment thereof in c) from said antibody or a fragment thereof,

thereby producing a population of chondrocytes, optionally free from said antibody or a fragment thereof.

9. (withdrawn) A method for isolating a sub-population of mammalian ES cells, the method comprising the steps of:

a) providing a cell suspension comprising ES cells,

b) contacting the cell suspension in a) with a monoclonal antibody or a fragment thereof binding according to claim 1, under conditions wherein said monoclonal antibody or a fragment thereof forms an antibody-antigen complex with the extracellular I-domain of integrin alpha10beta1,

c) separating cells binding to the monoclonal antibody or a fragment thereof in b), and optionally

d) recording cells binding to the monoclonal antibody or a fragment thereof in c) from said antibody or a fragment thereof,

thereby producing a population of chondrocytes, optionally free from said antibody or a fragment thereof.

10. (withdrawn) The method according to claim 7, wherein the monoclonal antibody or a fragment thereof is linked to a solid phase.

11. (withdrawn) The method according to claim 7, wherein the solid phase is beads.

12. (withdrawn) The method methods according to claim 7, wherein the mammalian cells are human cells.

13. (withdrawn) The methods according to claim 7, wherein the mammalian cells are murine cells.

14. (withdrawn) A population of mammalian mesenchymal stem cells obtainable by the methods according to claim 7.

15. (withdrawn) The population of mammalian stem cells according to claim 14, being human mesenchymal stem cells.

16. (withdrawn) The population of mammalian stem cells according to claim 14, being murine mesenchymal stem cells.

17. (withdrawn) A population of mammalian chondrocytes obtainable by the method according to claim 8.

18. (withdrawn) The population of mammalian chondrocytes according to claim 17, being human chondrocytes.

19. (withdrawn) The population of mammalian chondrocytes according to claim 17, being murine chondrocytes.

20. (withdrawn) A subpopulation of mammalian ES cells obtainable by the method according to claim 7.

21. (withdrawn) The population of mammalian ES cells according to claim 20, being human chondrocytes.

22. (withdrawn) The population of mammalian ES cells according to claim 20, being murine chondrocytes.

23. (withdrawn) A method for detecting a mesenchymal stem cell in a sample, the method comprising the steps of:

a) providing a sample cell suspension comprising a mesenchymal stem cell,

b) contacting said sample cell suspension with a monoclonal antibody or a fragment thereof according to claim 1,

c) incubating the sample cell suspension and the monoclonal antibody or a fragment thereof under conditions wherein said monoclonal antibody or a fragment thereof forms an antibody-antigen complex with the

extracellular domain of integrin alpha10beta1 on a mesenchymal stem cell,

d) optionally adding a second labeled antibody or a fragment thereof to the sample, wherein the second antibody or a fragment thereof binds to the monoclonal antibody or a fragment thereof in b), and

e) detecting the monoclonal antibody or a fragment thereof bound to the extracellular domain of integrin alpha10beta1 of the sample b), or optionally detecting the second labeled antibody or a fragment thereof in c) bound to the monoclonal antibody or a fragment thereof,

thereby detecting the mesenchymal stem cell.

24. (withdrawn) A method for detecting a chondrocyte in a sample, the method comprising the steps of:

a) providing a sample cell suspension comprising a chondrocyte,

b) contacting said sample cell suspension with a monoclonal antibody or a fragment thereof according to claim 1,

c) incubating the sample cell suspension and the monoclonal antibody or a fragment thereof under conditions wherein said monoclonal antibody or a fragment thereof forms an antibody-antigen complex with the extracellular domain of integrin alpha10beta1 on a chondrocyte,

d) optionally adding a second labeled antibody or a fragment thereof to the sample, wherein the second antibody or a fragment thereof binds to the monoclonal antibody or a fragment thereof in b), and

e) detecting the monoclonal antibody or a fragment thereof bound to the extracellular domain of integrin alpha10beta1 of the sample b), or optionally detecting the second labeled antibody or a fragment thereof in c) bound to the monoclonal antibody or a fragment thereof,

thereby detecting the chondrocyte.

25. (withdrawn) A method for detecting an ES cell in a sample, the method comprising the steps of:

a) providing a sample cell suspension comprising an ES cell,

b) contacting said sample cell suspension with a monoclonal antibody or a fragment thereof according to claim 1,

c) incubating the sample cell suspension and the monoclonal antibody or a fragment thereof under conditions wherein said monoclonal antibody or a fragment thereof forms an antibody-antigen complex with the extracellular domain of integrin alpha10beta1 on an ES cell,

d) optionally adding a second labeled antibody or a fragment thereof to the sample, wherein the second antibody or a fragment thereof binds to the monoclonal antibody or a fragment thereof in b), and

e) detecting the monoclonal antibody or a fragment thereof bound to the extracellular domain of integrin alpha10beta1 of the sample b), or optionally detecting the second labeled antibody or a fragment thereof in c) bound to the monoclonal antibody or a fragment thereof

thereby detecting the ES cell.

26. (withdrawn) A method for blocking the binding of a chondrocyte to an extracellular matrix molecule (ECM), the method comprising the steps of:

a) providing a monoclonal antibody or a fragment thereof according to claim 1,

b) contacting said monoclonal antibody with said chondrocyte under conditions wherein said monoclonal antibody or a fragment thereof forms an antibodyantigen complex with the extracellular domain of integrin alph10beta1, and

c) incubating the antibody-antigen complex in b) above,

thereby blocking the binding of a chondrocyte to said ECM molecule.

27. (withdrawn) A method for modulating the signaling of alpha10beta1 on a mammalian mesenchymal stem cell, ES cell or a chondrocyte, the method comprising the steps of:

a) providing a monoclonal antibody or a fragment thereof according to claim 1,

b) contacting said stem cell or chondrocyte under conditions wherein said monoclonal antibody or a fragment thereof forms an antibody-antigen complex with the extracellular domain of integrin alpha10beta1 on said cells, and

c) incubating said antibody-antigen complex,

thereby modulating the signaling of alpha10beta1 on a human mesenchymal stem cell, ES cell or a chondrocyte.

28. (withdrawn) A method for detecting the expression of integrin alpha10beta1 in a tissue sample or on a cell surface, the method comprising the steps of: of

a) providing a tissue sample or a cell,

b) providing a monoclonal antibody or a fragment thereof according to claim 1 in the tissue sample or cell,

c) incubating the tissue sample or cell and the monoclonal antibody or a fragment thereof under conditions wherein said monoclonal antibody or a fragment thereof forms an antibody-antigen complex with the extracellular domain of integrin alpha10beta1,

d) optionally adding a second labeled antibody or a fragment thereof to the sample, wherein the second antibody or a fragment thereof binds to the monoclonal antibody or a fragment thereof in b), and

e) detecting the monoclonal antibody or a fragment thereof bound to the extracellular domain of integrin alpha10beta1 of the sample b), or optionally detecting the second labeled antibody or a fragment thereof in c) bound to the monoclonal antibody of a fragment thereof.

29. (withdrawn) A method for in vivo imaging the expression of the integrin alpha10beta1 in a mammal, the method comprising the steps of:

a) providing a mammal,

b) providing an monoclonal antibody or a fragment thereof according to claim 1, and wherein said monoclonal antibody or a fragment thereof optionally are conjugated,

c) administering the monoclonal antibody or a fragment thereof to the mammal so as to allow the antibody or a fragment thereof to bind to the extracellular I-domain of integrin alpha10beta1 of cells in said mammal,

d) optionally adding a second labeled antibody or a fragment thereof to the sample, wherein the second antibody or a fragment thereof binds to the monoclonal antibody or a fragment thereof in c),

e) detecting the monoclonal antibody or a fragment thereof bound to the extracellular I-domain of integrin alpha10beta1 of said cells in c), or optionally detecting the second labeled antibody or a fragment thereof in d) bound to the monoclonal antibody or a fragment thereof, and

f) creating an image of the detected antibody or a fragment thereof,

thereby imaging the expression of integrin alpha10beta1 on cells in a mammal in vivo.

30. (withdrawn) The method according to claim 29, wherein the extracellular I-domain of integrin alpha10beta1 is on a cell in an atherosclerotic plaque in a blood vessel.

31. (currently amended) A composition comprising a monoclonal antibody or fragment thereof according to ~~claim 1~~ claim 5.

32. (currently amended) ~~The~~ A composition according to claim 31 wherein the monoclonal antibody or a fragment thereof further comprises a detectable label.

33. (currently amended) An administration vehicle comprising a monoclonal antibody of fragment thereof according to ~~claim 1~~ claim 5.

34. (currently amended) An administration vehicle comprising a monoclonal antibody or fragment thereof according to ~~claim 1~~ claim 5, a pharmaceutical acceptable carrier, and a pharmaceutical acceptable drug affecting joint diseases or atherosclerosis.

35. (currently amended) A pharmaceutical composition for the treatment of musculoskeletal diseases, arthritis or atherosclerosis comprising a monoclonal antibody or [[a]] fragment thereof according to ~~claim 1~~ claim 5.

36. (currently amended) A pharmaceutical composition for gene therapy treatment of musculoskeletal diseases, arthritis or atherosclerosis comprising a monoclonal antibody or fragment thereof according to ~~claim 1~~ claim 5, wherein the monoclonal antibody or fragment targets gene delivery to integrin alpha10 beta1 expressing cells.

37. (currently amended) ~~The~~ A pharmaceutical composition according to claim 36 comprising adenovirus for gene therapy treatment of arthritis.

38. (currently amended) A kit comprising a monoclonal antibody or fragment thereof according to ~~claim 1~~ claim 5.

39. (currently amended) ~~The~~ A kit according to claim 38, wherein the monoclonal antibody or [[a]] fragment thereof is bound to a solid phase.

40. (currently amended) ~~The~~ A kit according to claim 38, wherein the monoclonal antibody or [[a]] fragment thereof comprises a detectable label.

41. (previously presented) A kit comprising a hybridoma cell line according to claim 6, and a cell culture medium for said hybridoma cell line.

42. (currently amended) A method for making a monoclonal antibody ~~according to claim 1~~ capable of binding to a protein which is specifically recognized by a monoclonal antibody or fragment thereof according to claim 5, the method comprising the steps of:

a) immunizing and boosting an alpha-10 knock-out mouse with recombinant alpha-10 I-domain;

b) fusing the spleen cells from the immunized mouse with immortalized cells to create hybridoma cells; and

c) culturing the hybridoma cells and isolating the antibodies produced thereby.

43. (previously presented) A method according to claim 42 wherein the immortalized cells are NSO cells.

44. (canceled)

45. (new) A monoclonal antibody, or fragment thereof, produced by a method according to claim 42, wherein the antibody is not produced by the hybridoma cell line deposited at the Deutsche Sammlung von Microorganismen und Zellkulturen GmbH under the accession number DSM ACC2583.

46. (new) A monoclonal antibody or fragment thereof according to claim 45, wherein the antibody or fragment is humanized.

47. (new) A monoclonal antibody or fragment thereof according to claim 45, wherein the fragment is selected from the group consisting of Fv, Fab, Fab', $F(ab')_2$ and single chain antibodies.

48. (new) A monoclonal antibody or fragment thereof according to claim 5, wherein the antibody or fragment is humanized.

49. (new) A monoclonal antibody or fragment thereof according to claim 5, wherein the fragment is selected from the group consisting of Fv, Fab, Fab', $F(ab')_2$ and single chain antibodies.